

Appl. No. 10/822,995
Attorney Docket No.: 2001B127B/2
Amtd. dated November 11, 2005
Reply to Office Action of August 22, 2005

REMARKS/ARGUMENTS

Application Amendments

By the amendments presented, the specification is rewritten on Page 1 to note that the parent application has now issued as U.S. Patent No. 6,768,036.

Further by the amendments presented, Claim 30 is rewritten to indicate that, in the claimed method for adding heat to a reactor system for converting oxygenates to olefins, catalyst in the regeneration zone is heated to a first temperature of at least about 225°C. Claim 30 is also re-written to indicate that sufficient heat is added to the regeneration zone in such a system to ignite the heating fuel so as to heat catalyst in this regeneration zone even further. Support for these Claim 30 amendments is found in the original specification in Paragraph [0050] on Page 12.

Upon entry of the claim amendments presented, Claims 30-35 remain in the application. No additional claim fee is due as a result of the claim amendments made.

Invention Synopsis

The present invention as now claimed in this application is directed to processes for adding heat to or initially increasing the temperature of a reactor system for converting oxygenates to olefins. This is accomplished by heating catalyst in the catalyst regeneration zone of such a reactor system, including heating such catalyst material by combusting a heating fuel which is added to the regeneration zone. The heating fuel is one which must have certain specified autoignition characteristics and certain maximum amounts of oxygenate conversion catalyst-poisoning contaminants such as sulfur, nitrogen, nickel, and vanadium. Catalyst heated in this manner in the regeneration zone is then circulated back to the oxygenates-to-olefins (OTO) reaction zone.

Art Rejection

Claims 30-35 have been rejected under 35 USC §103(a) as being allegedly unpatentably obvious over Lattner et al. (U.S. Patent No. 6,023,005, hereinafter "Lattner") in view of Harandi

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et al. (U.S. Patent No. 4,939,314, hereinafter "Harandi"). The Examiner contends that it would have been obvious to add heating fuel to the catalyst regeneration zone of the Lattner OTO set-up in light of the Harandi disclosure of heating fuel added to the regenerator of the Harandi oligomerization process. Such a rejection is respectfully traversed as it would apply to the claims as amended herein.

Lattner discloses an oxygenates to light olefins (OTO) process wherein a catalyst regenerator is used to remove coke deposits from only a portion of the total catalyst inventory in the OTO reaction zone so as to improve selectivity of the process to production of light olefins. There is no disclosure in Lattner of any addition of heating fuel to, or combustion of heating fuel within, the catalyst regeneration zone of the Lattner process. There is, furthermore, no disclosure in Lattner of any reason or need to ever add for any purpose whatsoever regenerated catalyst to the OTO reaction zone which has been heated in excess of the heating obtained by the burning of coke therefrom.

Harandi discloses a high pressure oligomerization process which includes an on-line low pressure catalyst regeneration set-up. Catalyst from and to the oligomerization reactor is passed through pressure adjusting lock hoppers (and a stripping zone) to and from a low pressure catalyst regenerator. For purposes of temperature control in the catalyst regenerator, and while recirculating catalyst is being held and processed in the lock hoppers or stripping zone, Harandi discloses that a fuel gas may be added to the regenerator. There is no teaching in Harandi of any catalyst being used to convey heat to the oligomerization reactor; no teaching of, or of the need for, any particular autoignition or contaminant content characteristics of the heating fuel; and no teaching of any applicability of the Harandi regeneration system to any operation other than high pressure oligomerization.

Applicants respectfully submit that the skilled artisan looking to address the problem of reaction zone temperature adjustment during start-up or periods of interruption of conversion feed would never turn to Lattner in the first place and would certainly have no reason to turn to the Harandi oligomerization process for any solution to temperature control during an OTO process. Lattner speaks only of the exothermic nature of the OTO reaction and the need to cool, not to add heat to, the reaction zone in such a process. Lattner furthermore introduces nothing

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except an oxygen-containing regeneration medium to the catalyst regenerator and so, of course, is not concerned with the minimization of any contaminants which might become entrained in the catalyst being regenerated and recirculated to the OTO reactor.

With respect to the Harandi reference, there is likewise nothing disclosed in that patent which would in any way suggest the need or appropriateness of combining its regeneration heating fuel teaching with the disclosures of Lattner. The only purpose of adding a heating fuel to the Harandi regenerator is temperature control within the regenerator. There is certainly no Harandi teaching or suggestion to use regenerator-heated catalyst to deliver heat to the reaction zone. And furthermore in the Harandi context, the passage of the regenerated catalyst through a pressurizing lock hopper and into contact with oligomerization feed would make it difficult to transfer heated catalyst back to the reactor.

Applicants respectfully submit that the reference combination of Lattner and Harandi is one made essentially in hindsight. In short, this reference combination has been made merely by virtue of Lattner relating to an OTO process with catalyst regeneration and because Harandi is directed to a process wherein heating fuel is added to a catalyst regenerator, albeit for a different purpose and in a different context from that of the present invention.

Given the foregoing considerations, it is submitted that the reference combination of Lattner in view of Harandi is not one which is properly made in rejection of Applicants' claims in the first place. And even if made, the combined teachings of these two patents still do not teach or suggest the particular process embodiments now set forth in Applicants' amended Claims 30-35. Continued rejection of these claims under 35 USC §103(a) over Lattner in view of Harandi would therefore be improper.

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CONCLUSION

Applicants have made an earnest effort to place their application in proper form and to distinguish their claimed invention from the applied prior art. WHEREFORE, reconsideration of this application, entry of the amendments presented, withdrawal of the claim rejection under 35 USC §103, and allowance of amended Claims 30-35 are respectfully requested.

Any comments or questions concerning the application can be directed to the undersigned at the telephone number given below.

Respectfully submitted,

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